WHAT IS CLAIMED IS:

- 1 1. A method for controlling an automated clutch 2 of a motor vehicle having an engine with a crankshaft and 3 a transmission with a transmission input shaft and a 4 transmission output shaft, wherein the automated clutch is 5 arranged to transmit a clutch torque between the 6 crankshaft and the transmission input shaft, and wherein 7 during at least one operating phase of the vehicle, the 8 automated clutch is controlled dependent on an engine rpm-9 gradient (dn_m/dt) , the method comprising: 10 determining a first engine rpm-gradient signal 11 $(dn_m(M)/dt)$ based on an engine torque signal (M_e) and 12 a target value (M_k) of the clutch torque; 13 b) recursively determining an engine rpm-rate signal 14 $(n_m(R))$ based on said engine rpm-gradient signal; 15 C) comparing an actual engine $\text{rpm-rate}\ (n_m)$ to said engine rpm-rate signal $(n_m(R))$ and determining a 16 17 correction quantity K based on said comparison; and 18 d) correcting said first engine rpm-gradient signal
 - 2. The method of claim 1, wherein the first

 $(dn_m(M)/dt)$ with said correction quantity.

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- engine rpm-gradient signal $(dn_m(M)/dt)$ is based on a
- 3 torque difference between the engine torque signal (Me)
- 4 and the target value (M_k) of the clutch torque.
- 1 3. The method of claim 1, wherein the correction
- 2 quantity K is based on a torque difference between the
- 3 actual engine rpm-rate (n_m) and said engine rpm-rate
- 4 signal $(n_m(R))$.
- 1 4. The method of claim 1, wherein the correction
- 2 quantity K is assigned a predetermined weight in said
- 3 correcting of the first engine rpm-gradient signal.
- 1 5. The method of claim 1, further comprising the
- 2 step of compensating a time lag occurring between a time
- 3 when a signal is generated and a time when said signal is
- 4 used in the method.
- 1 6. The method of claim 1, further comprising the
- 2 step of compensating a time lag occurring between a time
- when the engine rpm-rate signal $(n_m(R))$ is generated and a
- 4 time when the actual rpm-rate (n_m) is determined.

- 7. The method of claim 5, wherein the signal
- 2 comprises the engine torque signal (M_e) .
- 1 8. The method of claim 5, wherein the signal
- comprises the engine rpm-rate signal $(n_m(R))$.
- 9. The method of claim 1, wherein the engine rpm-
- 2 gradient (dn_m/dt) is used to determine a characteristic
- 3 quantity of the clutch.
- 1 10. The method of claim 9, wherein said
- 2 characteristic quantity of the clutch comprises a friction
- 3 value (RW) approximating a physical friction value of the
- 4 clutch.
- 1 11. A method for controlling an automated clutch
- 2 in a power train of a motor vehicle having an engine with
- 3 a crankshaft and a transmission with a transmission input
- 4 shaft and a transmission output shaft, wherein the
- 5 automated clutch is arranged between the crankshaft and
- 6 the transmission input shaft, and wherein a torque to be
- 7 transmitted from the engine to the transmission is
- 8 transmitted by means of a frictional engagement between a

- 9 first clutch component that is rotationally fixed on the
- 10 crankshaft and a second clutch component that is
- 11 rotationally fixed on the transmission input shaft,
- 12 wherein said frictional engagement is characterized at
- 13 least by a physical friction value that changes dependent
- on an operating state of the clutch, the method comprising
- 15 the step of modeling the physical friction value as a
- 16 friction value (RW) in a clutch control unit based on at
- 17 least one parameter of the power train, wherein the
- 18 friction value (RW) contains a component representing a
- 19 dependency of the friction value from a clutch
- 10 temperature.
- 1 12. The method of claim 11, further comprising
- 2 the step of measuring the clutch temperature by means of a
- 3 temperature sensor.
- 1 13. The method of claim 11, further comprising
- 2 the step of determining the clutch temperature by means of
- 3 a temperature model, wherein at least one of a
- 4 transmission temperature, an engine temperature, an
- 5 ambient temperature, an engine coolant temperature, and an
- 6 elapsed time since the engine was last turned off is taken

- 7 into account.
- 1 14. The method of claim 11, wherein a limit for a
- 2 maximum amount of change of the friction value is set as a
- 3 function of the clutch temperature.
- 1 15. The method of claim 14, wherein said maximum
- 2 amount is set as a limit value for a rate of change of the
- 3 clutch temperature.
- 1 16. The method of claim 14, wherein said maximum
- 2 amount is adjustable.
- 1 17. The method of claim 16, wherein said maximum
- 2 amount is adjustable as a function of the clutch
- 3 temperature.
- 1 18. The method of claim 14, further comprising
- 2 the steps of
- 3 storing a set of data relating to the clutch
- 4 temperature when the vehicle is switched off;
- 5 retrieving said data when the vehicle is switched on
- 6 again, and

- 7 determining a current friction value based on said
- 8 data.
- 1 19. The method of claim 18, wherein said maximum
- 2 amount is adjusted if and when the vehicle is switched on
- 3 at a time when the clutch temperature is still
- 4 significantly warmer than the ambient temperature.
- 1 20. The method of claim 18, wherein the current
- 2 friction value is determined based further on an amount of
- 3 time elapsed since the vehicle was last switched off.
- 1 21. The method of claim 18, wherein the current
- 2 friction value is determined based further on an actual
- 3 clutch temperature existing at a time when the vehicle is
- 4 switched on again.
- 1 22. The method of claim 20, wherein the current
- 2 friction value is determined based on an assumption that
- 3 the current friction value has a linear relationship to
- 4 the amount of time elapsed since the vehicle was last
- 5 switched off.

- 1 23. The method of claim 20, wherein the current
- 2 friction value is determined based on an assumption that
- 3 with increasing time since the vehicle was last switched
- 4 off, the current friction value asymptotically converges
- 5 towards an ambient-temperature friction value.
- 1 24. The method of claim 1, further comprising the
- 2 steps of determining and correcting a movement-opposing
- 3 torque of the vehicle.
- 1 25. The method of claim 24, wherein the movement-
- 2 opposing torque is corrected by means of correction values
- 3 that are given as a characteristic curve in function of an
- 4 air resistance.
- 1 26. The method of claim 24, wherein the movement-
- 2 opposing torque is corrected dependent on a grade angle of
- 3 a road being traveled by the vehicle.
- 1 27. The method of claim 24, wherein the movement-
- 2 opposing torque is corrected by means of a correction
- 3 signal, and wherein said correction signal is determined
- 4 based on at least one error between an estimated value and

- 5 an actual value of at least one quantity.
- 1 28. The method of claim 27, wherein the at least
- one quantity comprises an engine rpm-rate, wherein the
- 3 estimated value is based on an effective engine torque,
- 4 and wherein the at least one error comprises a first error
- 5 based on a comparison between the estimated value and the
- 6 actual value of the engine rpm-rate.
- 1 29. The method of claim 27, wherein the at least
- one quantity comprises comprises a traveling-speed related
- 3 quantity, wherein the estimated quantity is based on an
- 4 effective engine torque, and wherein the at least one
- 5 error comprises a second error based on a comparison
- 6 between the estimated value and the actual value of the
- 7 traveling-speed related quantity.
- 1 30. The method of claim 29, wherein the
- 2 traveling-speed related quantity comprises a wheel rpm-
- 3 rate.
- 1 31. The method of claim 29, wherein the effective
- 2 engine torque is corrected with an estimated value for a

- 3 transmitted clutch torque.
- 1 32. The method of claim 28, wherein said first
- 2 error is used to correct at least one estimated quantity.
- 1 33. The method of claim 29, wherein said second
- 2 error is used to correct at least one estimated quantity.